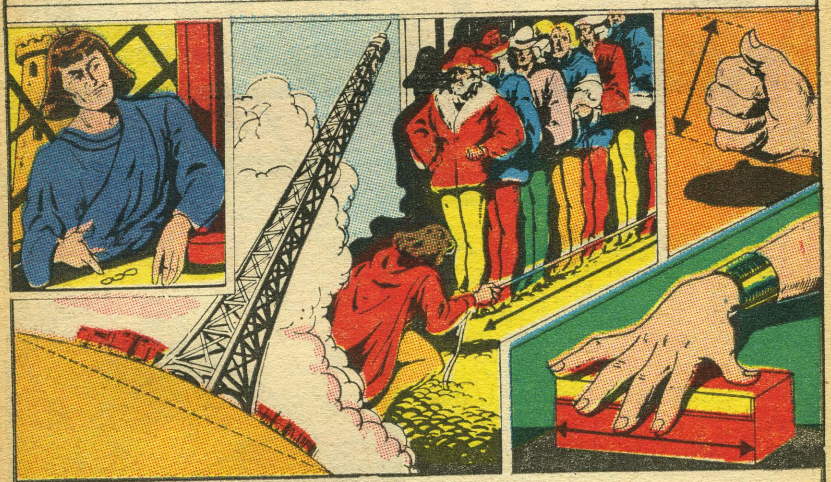
THE AMAZING STORY OF MEASUREMENT



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SINCE TIME BEGAN...

MAN HAS ALWAYS MEASURED THE WORLD AROUND HIM. THE CAVE-MAN JUDGED DISTANCES BY EYE OR TIME, COMPARED SIZES BY PACES OR BY MATCHING OBJECTS WITH TREES, STONES OR MOUNTAINS THAT HE KNEW FROM MEMORY. HIS WORLD DEMANDED NO ACCURACY ---- ANY SIZE CAVE WOULD DO IF HIS FAMILY WOULD FIT INTO IT.

HIS BODY BECAME HIS YARDSTICK--

AS HIS NEEDS REQUIRED GREATER ACCURACY, HIS HEIGHT, HIS ARMS OUT-STRETCHED, HIS FEET AND HIS HANDS BECAME ROUGH METHODS OF MEASURING CLOTHING, WEAPONS ETC.

NO STANDARDS WERE EVER RECORDED ---- EACH PERSON HAD HIS OWN METHODS OF MEASURING FOR HIS OWN NEEDS --- EACH PERSON WORKED ALONE WHEN MEASUREMENTS WERE INVOLVED.

IN 6,000 B.C.--

THE FIRST KNOWN STANDARDS OF MEASUREMENT WERE ESTABLISHED IN THE ADVANCED CIVILIZATIONS ALONG THE *NILE* AND ON THE PLAINS OF **CHALDEA!**

THE CUBIT

BECAME THE PRIME MEASUREMENT. IT WAS THE BENT FOREARM FROM THE POINT OF THE ELBOW TO THE TIP OF THE MIDDLE FINGER OF THE OUTSTRETCHED HAND-- ROUGHLY 18 TO 19 INCHES. IN 4000 B.C., THE CUBIT WAS STANDARDIZED AT WHAT IS NOW 18.24 INCHES.

THE CUBIT WAS USED IN BUILDING *ALL* THE **PYRAMIDS!** --- EACH SIDE MEASURES 500 CUBITS, AND ALL MEASUREMENTS ARE IN MULTIPLES --- OR FRACTIONS OF CUBITS. THE PERIMETER OF THE PYRAMIDS MEASURES 2000 CUBITS --- OR ½ A *MERIDIAN MILE.*

(SEE PAGE 6)

EARLY EGYPTIANS ALSO USED:

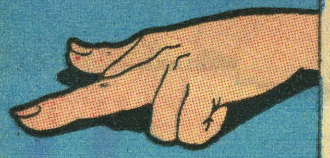
THE SPAN--

THE LENGTH BETWEEN THE TIPS OF THUMB AND LITTLE FINGER OF THE OUTSTRETCHED HAND --- ½ A CUBIT OR 9 INCHES.

THE UNIVERSAL SIZE OF A BRICK IS A *SPAN* BY ½ *SPAN* BY A *NAIL* --- (THE LAST 2 JOINTS OF THE MIDDLE FINGER.)

THE PALM --

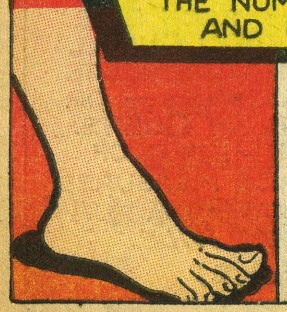
THE BREADTH OF 4 FINGERS --- ⅙ OF A CUBIT -- OR ABOUT 3 INCHES. WIDELY USED BY MERCHANTS FOR MEASURING CLOTH.



THE DIGIT --

1/24 CUBIT --- THE BREADTH AT MIDDLE OF *MIDDLE FINGER* --- ¾ INCH.

FROM THIS DIVISION OF THE CUBIT INTO 24 DIGITS, AND THE DIVISION OF A SPAN INTO 12 DIGITS, CAME THE NUMBER OF HOURS IN A DAY AND MONTHS IN A YEAR!



THE FOOT --

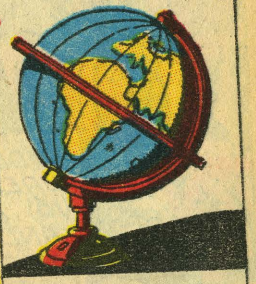
WAS ADOPTED QUITE LATE IN HISTORY. (*JUST AS THE* ***PYRAMIDS*** *WERE BEING BUILT.*) IT EQUALLED 2/3 OF A CUBIT, 4 PALMS, OR 16 DIGITS, MEASURED ABOUT 12.16 INCHES.

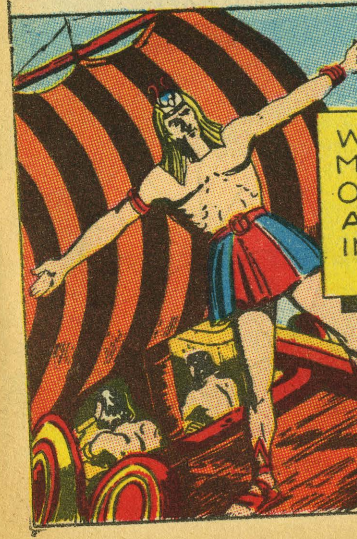
EVEN MODERN SCIENCE CAN'T IMPROVE ON IT!

THE ANCIENT'S KNOWLEDGE OF ASTRONOMY AND LAND MEASUREMENT WAS OF SUCH ACCURACY THAT EVEN MODERN SCIENCE CAN'T IMPROVE GREATLY ON MERIDIAN MEASUREMENTS MADE IN EGYPT AND CHALDEA 60 CENTURIES AGO!

THE MERIDIAN MILE ...

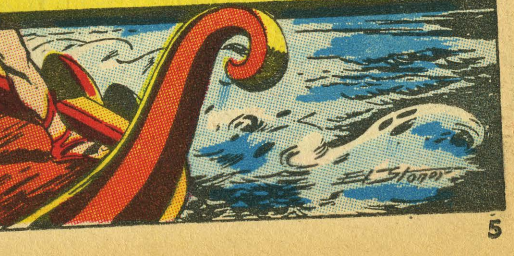
THE UNIT USED BY SEAMEN THE WORLD OVER TODAY, WAS ESTABLISHED BY 4000 B.C. AS 4000 CUBITS OR 1000 EGYPTIAN FATHOMS. (DON'T FORGET THAT EVEN THE PYRAMIDS MEASURE EXACTLY ⅛ OF A MERIDIAN MILE ALONG EACH SIDE!)



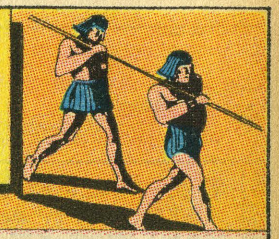


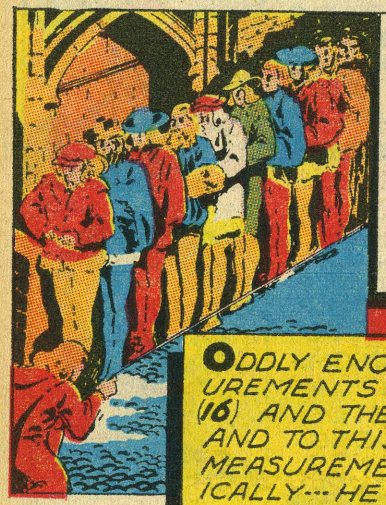
THE FATHOM

WAS AN ANCIENT EGYPTIAN MEASURE EQUAL TO THE LENGTH OF THE OUTSTRETCHED ARMS -- ABOUT 6 FEET. IT IS STILL USED IN NAUTICAL MEASUREMENT INTERNATIONALLY!



THE **REED** WAS THE FORERUNNER TO THE **ROD.** IT EQUALLED A DOUBLE FATHOM--- 8 CUBITS, 12 FEET OR 16 SPANS.



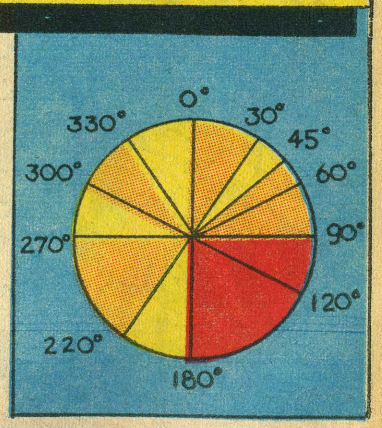


IT WASN'T UNTIL THE 16TH CENTURY A.D THAT THE ROD WE KNOW WAS ESTABLISHED AS THE LENGTH OF THE *LEFT FEET* OF THE FIRST 16 MEN OUT OF CHURCH ON A CERTAIN SUNDAY!

ODDLY ENOUGH ALL ANCIENT MEASUREMENTS WERE IN THE SEXDECIMAL (16) AND THE DUODECIMAL SYSTEMS, AND TO THIS DAY, MAN STICKS TO MEASUREMENTS HE CAN MATCH PHYSICALLY--- HE FIGHTS THE ACCEPTANCE OF THE DECIMAL SYSTEM!

CHALDEANS

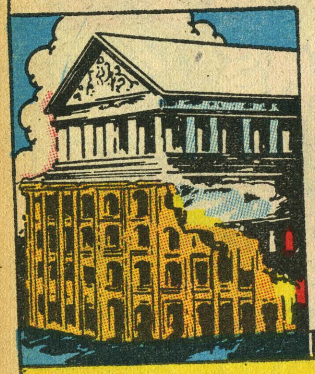
WORSHIPPED THE NUMBERS 6, 60, 600 ETC, AND THEIR ASTROLOGY ESTABLISHED THE CIRCLE AS 360° (DEGREES) THEY ALSO SET THE YEAR AS 6 MONTHS OF 60 DAYS EACH, PLUS 5 DAYS AT THE YEAR-END.



ALEXANDER THE GREAT

CONQUERED THE WORLD AND ANCIENT MEASUREMENTS WERE CARRIED TO GREECE AND ROME AS STANDARDS FOR FOREIGN TRADE.

THE GREEKS AND ROMANS

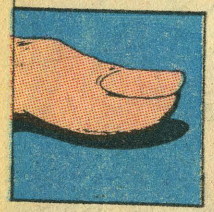


SOON SET UP THEIR OWN STANDARDS FOR THE LONGER DISTANCES --- COMBINING OLYMPIC, PERSIAN, CHALDEAN AND EGYPTIAN MEASURES. THESE INCLUDED SUCH MEASURES AS STADIA (1/10 OF A MERIDIAN MILE;--- SCHOINOS, (1/10 OF A DEGREE) AND PARASANGS (4 MILES), BUT ONLY ONE EXISTS TODAY.

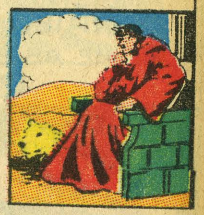
THE MILLE OR MILE!

1000 PACES OR DOUBLE STEPS WAS ESTABLISHED AS THE STATUTE MILE (THEN EQUIVALENT TO 5000 FEET OR 4/5 OF A MERIDIAN MILE.)

THE ROMANS ALSO INVENTED THE INCH!



ORIGINALLY CALLED THE "THUMB-BREADTH", IT DIVIDED THE FOOT INTO 12 UNITS.

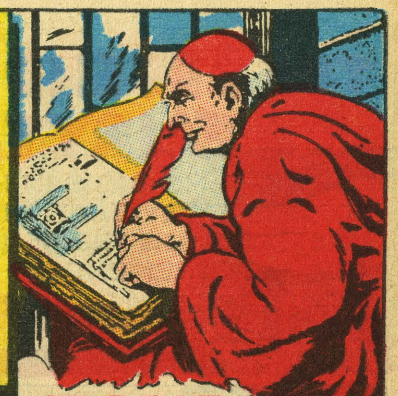


IN 1150 A.D. KING DAVID I OF SCOTLAND RULED THAT THE *INCH* WAS THE MEAN MEASURE OF THE THUMBS OF 3 MEN ... "A MEKILL MAN, A MAN OF MESSURABIL STATUR AND OF A LYTELL MAN. THE "THOUMS" ARE TO BE MESSURIT AT THE RUT OF THE NAYLE"!

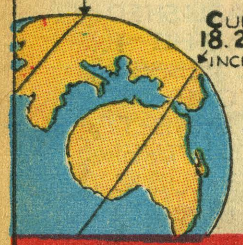
IN 1324, ENGLAND'S KING EDWARD II DECREED THAT 3 BARLEY-CORNS TAKEN FROM THE MIDDLE OF THE EAR AND PLACED END TO END EQUALLED 1 INCH!

GEODESY--

THE ART OF MEASURING THE EARTH AND ITS SHAPE INFLUENCED MEASUREMENT THROUGH THE 9TH CENTURY --- STANDARDS WERE NO LONGER BASED ON HUMAN MEASUREMENTS AS SUCH ---



BUT



THE CUBIT AND OTHER ACCEPTED UNITS BEGAN TO VARY IN LENGTH WITH THE MERIDIAN ON WHICH PEOPLE LIVED. DIFFERENT MEASUREMENTS WERE BY LAW DECREED FOR DIFFERENT COUNTRIES --- ALL BASED ON ASTROLOGY AND THE MERIDIAN OF THE LOCALE.

SO --

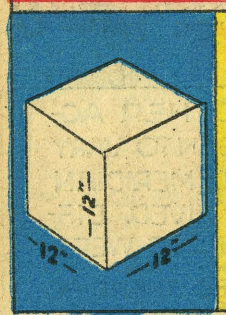
THERE WAS A RETURN TO NATURAL AND HUMAN MEASUREMENT WHICH PERSISTED THROUGH ---

THE DARK AGES!

THE LEGEND OF THE FOOT IS A FAIRYTALE!

THERE IS NO BASIS IN HISTORY FOR THE STORY THAT THE FOOT WAS BASED ON THE HEEL-AND-TOE MEASUREMENT OF

KING ALFRED'S FOOT!



IT IS MORE LIKELY

THAT KING ALFRED ESTABLISHED THE ENGLISH FOOT AS THE MEASURE OF A CUBICAL VESSEL CONTAINING 1000 ROMAN OUNCES OF WATER! THIS SET A STANDARD FOR BOTH THE LINEAL FOOT AND THE CUBIC FOOT OF CAPACITY.

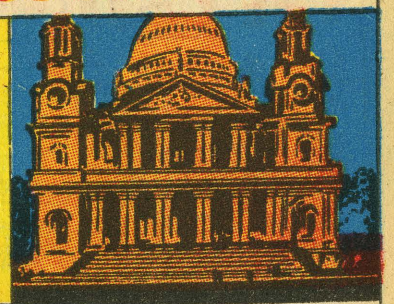
THE YARD IS A DIFFERENT STORY--

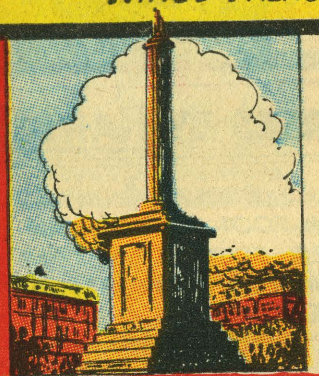
THIS MEASURE OF 3 FEET OR ½ FATHOM WAS DECREED BY KING HENRY I TO BE THE DISTANCE FROM THE TIP OF HIS NOSE TO THE END OF HIS THUMB!

"YARD" COMES FROM THE OLD ENGLISH "GERDE" OR "YERDE" --- MEANING "WAND".

THINGS BECAME SO CONFUSED--

BY THE 13TH CENTURY THAT ALL ENGLISH LAND MEASUREMENTS WERE MADE IN ACCORDANCE WITH THE FOOT STORED IN SAINT PAUL'S CHURCH, AND WITH THE IRON "ELL" IN THE KING'S PALACE.





EVEN TODAY

YOU'LL FIND THE STANDARD MEASURES OF LENGTH IMBEDDED IN THE BASE OF THE NORTHERN WALL OF TRAFALGAR SQUARE, IN THE LONDON GUILD HALL AND IN CHIEF PUBLIC BUILDINGS ALL OVER ENGLAND, PLACED THERE TO HELP SETTLE DIFFICULTIES.

IN 1500 THE ENGLISH MILE WAS FINALLY ESTABLISHED LIKE THIS:

3	BARLEYCORNS (LENGTHWISE)	=	1	INCH
12	INCHES	=	1	FOOT
3	FEET	=	1	YARD
9	INCHES	=	1	SPAN
5	SPANS	=	1	ELL *
5	FEET	=	1	PACE
125	PACES	=	1	FURLONG
5½	YARDS	=	1	ROD
40	RODS	=	1	FURLONG
8	FURLONGS	=	1	ENGLISH MILE.
12	FURLONGS	=	1	LEAGUE

* ORIGINAL CLOTH MEASURE.

THE BIRTH OF PRECISION!

THE **POPPYSEED** BECAME A MEANS OF PRECISE MEASURE IN THE **1700**S! THE INCH DIVIDED INTO **3** BARLEYCORNS, EACH CORN EQUALLED **4** POPPYSEEDS---AND EACH SEED EQUALLED **12** HUMAN HAIRS.

WE STILL MEASURE HORSES BY HANDS!

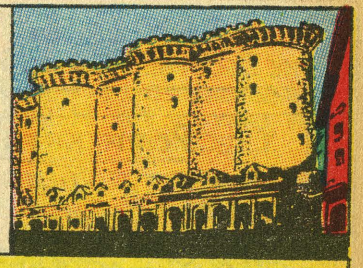
THE "HAND" EQUALS **4** INCHES OR 1/3 OF A FOOT--A MODERN CARRYOVER FROM A SYSTEM POPULAR IN **1700**. IN AUSTRIA, THE "FAUST" OR FIST IS USED TO MEASURE HORSES.

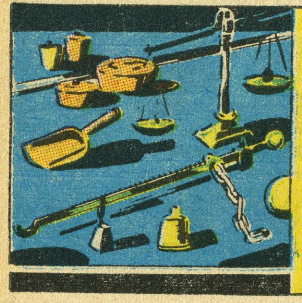
THE SHAFTMENT--

ANOTHER POPULAR MEASURE THROUGH THE AGES. THE FIST WITH THUMB PROTRUDING EQUALS **6** INCHES. IT'S CALLED "BAUD" IN WALES, "SOMESSO" IN ITALY, "KUBDEH" IN EGYPT AND "TAIM" IN BURMA.

IN FRANCE

NEARLY EVERY CITY AND PROVINCE HAD ITS OWN SYSTEM OF WEIGHTS AND MEASURES.





MARSEILLES,

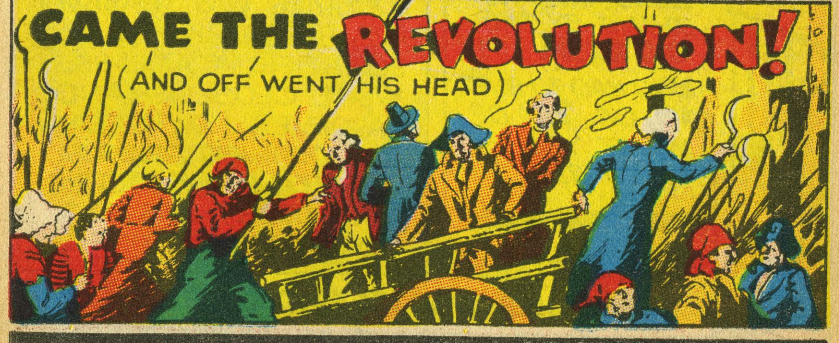
FOR EXAMPLE, HAD MEASURES FAMOUS THE WORLD OVER---AND ITS WATERFRONT SHOPS STILL SECRETLY USE THEM TODAY, DESPITE LAWS ENFORCING THE *METRIC SYSTEM!*

KING LOUIS XVI

WAS DISCUSSING THE POSSIBLE UNIFICATION OF FRENCH MEASURING SYSTEMS----COMBINING THE PARIS AND MARSEILLES METHODS--WHEN---

CAME THE REVOLUTION!

(AND OFF WENT HIS HEAD)



ON MAY 8, 1790 --

THE DECIMAL METRIC SYSTEM WAS IMPOSED UPON THE FRENCH BY LAW OF THE REPUBLICAN CONVENTION !

IT WAS BASED ON A RATHER INACCURATE SYSTEM OF METRIC DECIMAL FRACTIONS OF THE QUARTER MERIDIAN RUNNING THROUGH PARIS.

THE MEASURES WERE VASTLY INCONVENIENT--- COMPARED WITH NOTHING IN OLD SYSTEM --- CAUSED UNTOLD CONFUSION --- AND ACTUALLY HAD TO BE ENFORCED BY SPIES AND POLICE !

THE CONVENTION *WENT ALL OUT FOR THE DECIMAL SYSTEM IN EVERYTHING!*

MONTHS WERE DIVIDED INTO 3 PERIODS OF 10 DAYS EACH --- PLUS A 5 DAY YEAR-END PERIOD CALLED JOURS SANSCULOTTIDES.
DAYS WERE DIVIDED INTO 10 HOURS OF 100 MINUTES OF 100 SECONDS.

IT WAS A CRIME

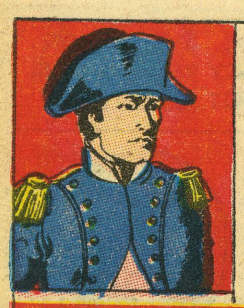
TO SELL EGGS, BUNS, OR ANYTHING BY THE **DOZEN !**

YOU HAD TO BUY **10** *OR* **20** *OF WHAT YOU WANTED !*

ON AUG 1, 1793

THE WEIGHTS & MEASURES COMMITTEE WAS THANKED FOR ITS WORK --- ALL SCIENTIFIC ACADEMIES WERE CLOSED --- AND LAVOISIER, (*THE GREAT SCIENTIST AND PRINCIPAL MEMBER OF THE* METRIC COMMITTEE), WAS SENT TO THE GUILLOTINE !

THE CITIZENS DIDN'T LIKE THE METRIC SYSTEM!



NAPOLEON

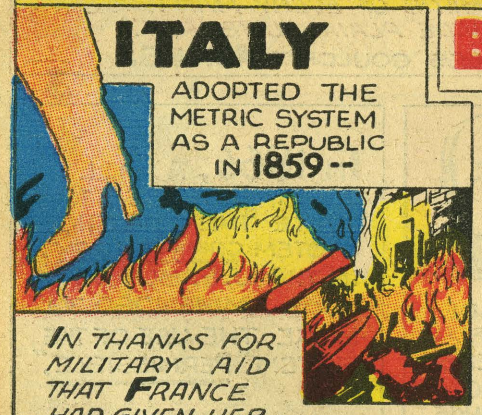
WON THE POPULAR ACCLAIM OF ALL FRENCHMEN WHEN HE RELAXED THE METRIC LAW IN **1799**, RETURNED THE GREGORIAN CALENDAR IN **1805**, AND PERMITTED THE OLD STANDARDS TO BE USED IN **1812** ! HE DID STANDARDIZE THE OLD SYSTEMS, HOWEVER.

UNDER LOUIS PHILLIPPE IN 1837.

THE METRIC-DECIMAL SYSTEM WAS RETURNED BY LAW IN ALL MEASURES EXCEPT TIME. (HOLLAND AND BELGIUM HAD NEVER LEFT THE METRIC MEASUREMENTS SINCE THEY WERE FORCED ON THEM IN **1792 - 1795** IN DEFEAT)

ITALY

ADOPTED THE METRIC SYSTEM AS A REPUBLIC IN **1859** --



IN THANKS FOR MILITARY AID THAT FRANCE HAD GIVEN HER AGAINST **AUSTRIA !**

BISMARCK

ADOPTED THE METER IN **1868** (WHEN PORTUGAL DID) AND MADE IT COMPULSORY IN ALL OF GERMANY IN **1872**.

HIS ACCEPTANCE HELPED SPREAD THE METRIC SYSTEM THROUGHOUT THE WORLD !

TODAY, 212 COUNTRIES USE THE METRIC SYSTEM OR 82% OF THE WORLD'S POPULATION. ONLY THE UNITED STATES AND GREAT BRITAIN DO NOT USE IT.

GEORGE WASHINGTON WAS WORRIED

ABOUT THE MANY DISCREPANCIES AND SECTIONAL DIFFERENCES IN WEIGHTS AND MEASURES IN THE UNITED STATES.

IN HIS 1ST ANNUAL ADDRESS TO CONGRESS, PRES. WASHINGTON SAID: *"UNIFORMITY OF CURRENCY, WEIGHTS AND MEASURES OF THE UNITED STATES IS AN OBJECT OF GREAT IMPORTANCE AND WILL, I AM PERSUADED, BE DULY ATTENDED TO."*

THOMAS JEFFERSON

AS USUAL AHEAD OF HIS TIME, RECOMMENDED IN 1790 THAT WE *"REDUCE EVERY BRANCH OF WEIGHTS & MEASURES TO THE SAME DECIMAL RATIO ALREADY ESTABLISHED FOR COIN AND BRING THE CALCULATIONS OF THE PRINCIPAL AFFAIRS OF LIFE WITHIN THE ARITHMETIC OF EVERY MAN WHO CAN MULTIPLY AND DIVIDE PLAIN NUMBERS".*

BUT CONGRESS COULDN'T ***AGREE!***

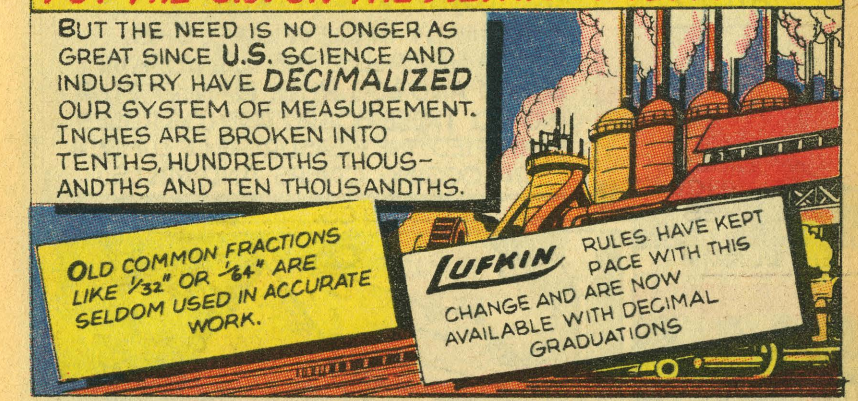
JOHN QUINCY ADAMS

FROM 1817-1821 MADE A THOROUGH STUDY OF FOREIGN MEASURING SYSTEMS PRO AND CON, AND RECOMMENDED THAT NO CHANGE BE MADE.

IN 1866, A BILL WAS INTRODUCED TO MAKE THE METRIC SYSTEM COMPULSORY IN THE U.S. BUT IT WAS AMMENDED TO MAKE THE USE OF THE SYSTEM "PERMISSIBLE."

IT WOULD COST AT LEAST $200.00 PER WORKER TO PUT THE U.S. ON THE METRIC SYSTEM!

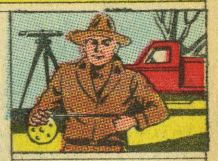
BUT THE NEED IS NO LONGER AS GREAT SINCE U.S. SCIENCE AND INDUSTRY HAVE *DECIMALIZED* OUR SYSTEM OF MEASUREMENT. INCHES ARE BROKEN INTO TENTHS, HUNDREDTHS THOUSANDTHS AND TEN THOUSANDTHS.



PIONEERING IN MEASUREMENT - - -

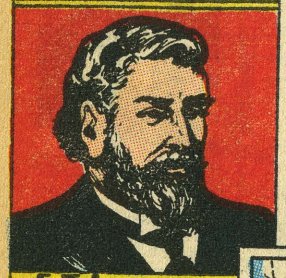
WITH BOARD AND LOG RULES AS BASIC PRODUCTS, LUFKIN SOON ADDED STEEL AND WOVEN MEASURING TAPES--METAL AND WOOD FOLDING AND MISCELLANEOUS RULES.

DURING THE PAST HALF CENTURY---



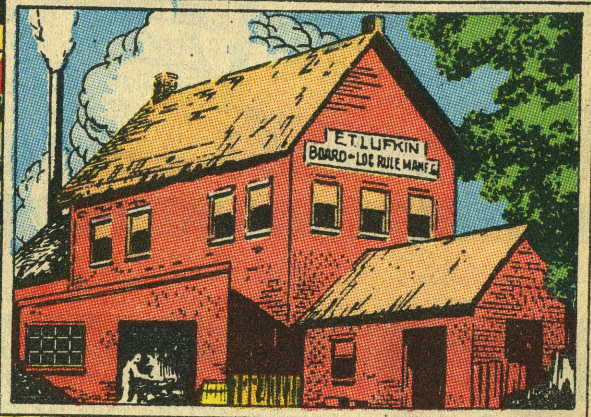
THE MAJORITY OF "MEN WHO MEASURE" HAVE DEPENDED UPON LUFKIN TO BRING TO THEIR WORK, TRUTH IN DIMENSIONS-- THE VERY BASIS OF QUANTITY PRODUCTION WHICH HAS MADE POSSIBLE OUR HIGHWAYS, OUR MOTOR CARS-- OUR HOMES FILLED WITH MECHANICAL MARVELS.

IN 1869 ---



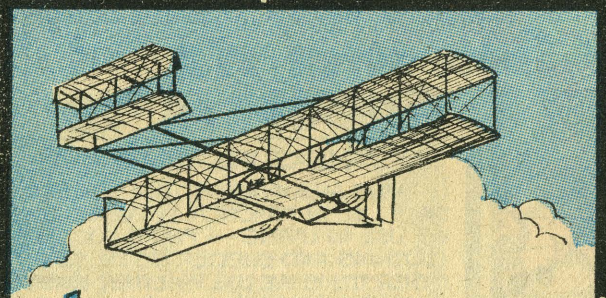
E.T. LUFKIN

NEARLY 30 YEARS BEFORE THE JOHANSSON INVENTION, E.T. LUFKIN FOUNDED A COMPANY IN CLEVELAND, OHIO, WHICH HE CALLED THE E.T. LUFKIN BOARD AND LOG RULE MANUFACTURING CO. THESE BOARD AND LOG RULES SIMPLIFIED THE MEASURING OF LUMBER IN LOGGING CAMPS AND MILLS.

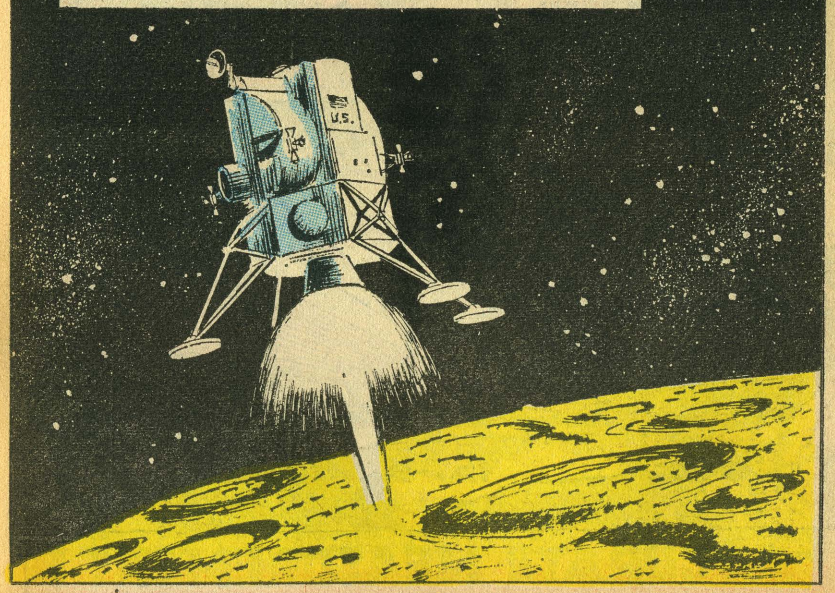


ORIGINAL HOME OF THE LUFKIN RULE CO.

SO, IN ORDER TO BE CLOSER TO THE FAST-GROWING LOGGING INDUSTRY, THE PLANT WAS MOVED IN 1890 TO SAGINAW, MICHIGAN, THE CENTER OF LUMBERING AT THAT TIME.



LUFKIN, MINDFUL OF ITS LONG HISTORY, IS EVEN MORE MINDFUL OF THE FUTURE. TIMES CHANGE. PEOPLE CHANGE. REQUIREMENTS CHANGE. LUFKIN REMAINS ALERT AND RESPONSIVE TO THESE CHANGES. IN THIS WAY LUFKIN CONTINUES TO SERVE AS THE WORLD'S LEADING MANUFACTURER OF TAPES AND RULES.

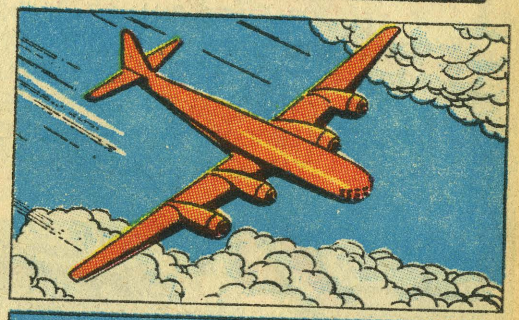


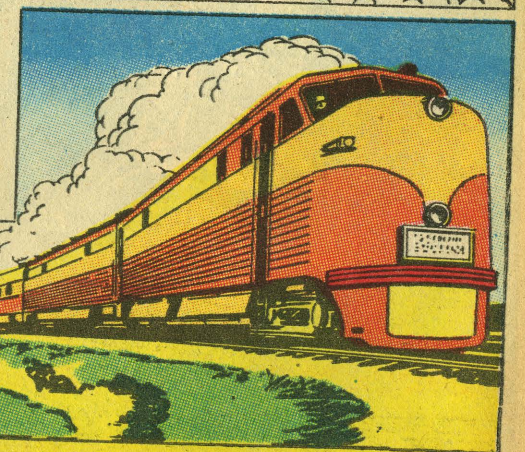
CIVILIZATION OWES IT'S PROGRESS TO---

MEASUREMENT:

IT PLAYS AN IMPORTANT ROLE IN OUR DAILY LIFE IN PRACTICALLY EVERY ITEM WE USE IN LIVING--- FROM FOOD, CLOTHING AND SHELTER TO THE MANY OTHER ITEMS WE USE WHETHER LUXURIES OR NECESSITIES, MEASUREMENT MUST BE UTILIZED IN ITS PRODUCTION.

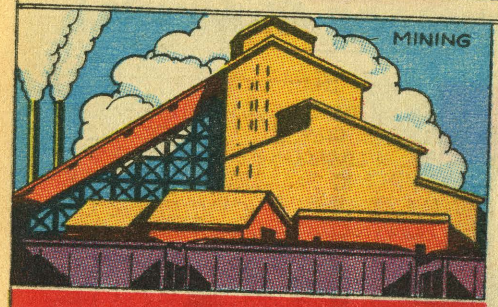
IN THE DAYS OF THE STAGE-COACH, THERE WAS LITTLE NEED FOR PRECISE MEASUREMENT AS WE KNOW IT TODAY.

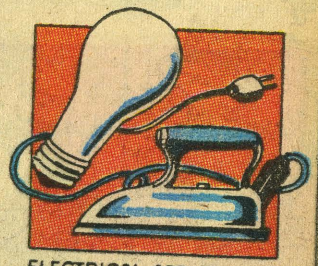




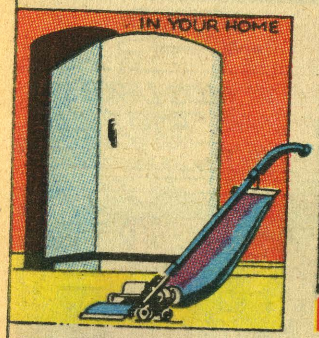
-ACCURATE MEASUREMENT!

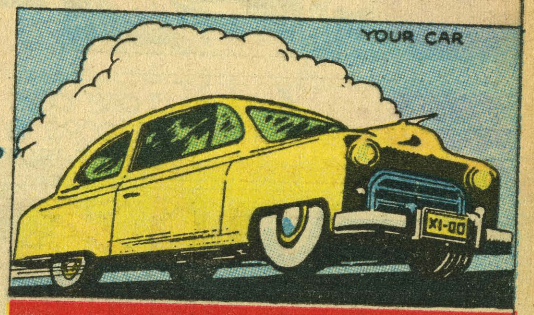
HUNDREDS OF RAILROADS, AUTOMOTIVE FIRMS, UTILITY COMPANIES AND MANUFACTURERS COUNT ON LUFKIN TAPES AND RULES. LUFKIN IS KNOWN WHEREVER MEN MEASURE.

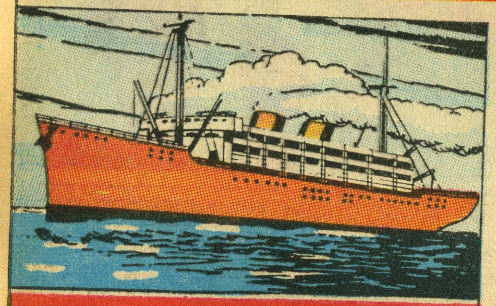


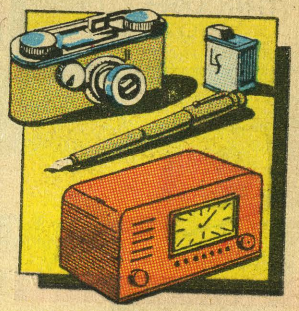


ELECTRICAL APPLIANCES









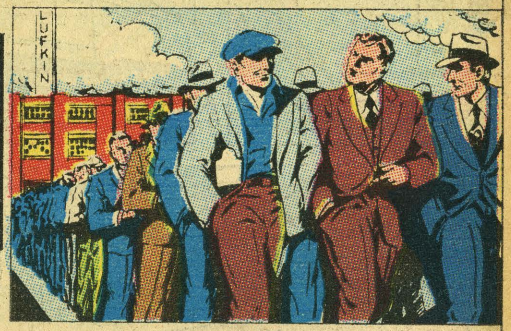
THESE AND THOUSANDS OF OTHER ARTICLES OR SERVICES WE USE DAILY REQUIRE THE USE OF ACCURATE MEASUREMENT IN THEIR PRODUCTION.

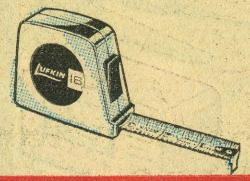
THE GROWTH OF LUFKIN IS THE GROWTH OF MANKIND!

LUFKIN IMPROVED ITS MEASURING TOOLS AS KNOWLEDGE OF MEASUREMENT INCREASED.

THUS TODAY: LUFKIN IS ONE OF THE WORLD'S LARGEST MANUFACTURERS OF TAPES, AND RULES FOR MEASUREMENT.

THE NAME LUFKIN IS A STANDARD OF ACCURACY AMONG HUNDREDS OF INDUSTRIES THROUGHOUT THE WORLD.

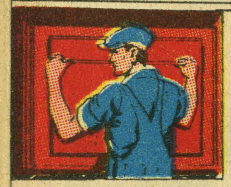




LUFKIN, FROM ITS MODEST BEGINNING 99 YEARS AGO, NOW EMPLOYS MANY HUNDREDS IN ITS LARGE MODERN PLANTS.

ACCURACY OF MEASUREMENT IS THE KEY TO PROGRESS!

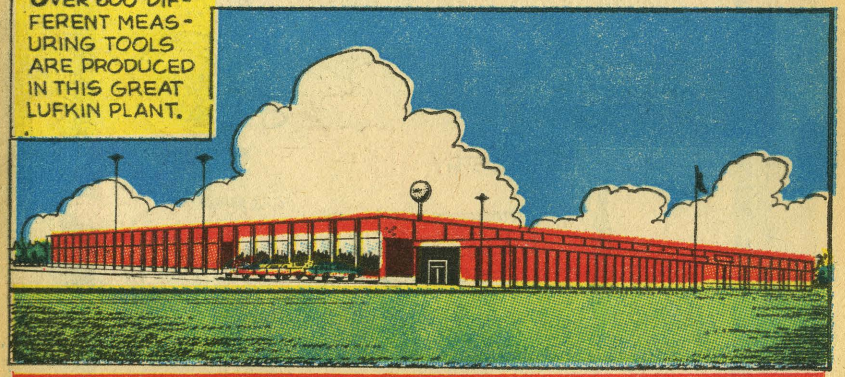
MANY EXAMPLES OF LUFKIN IMPROVEMENTS.



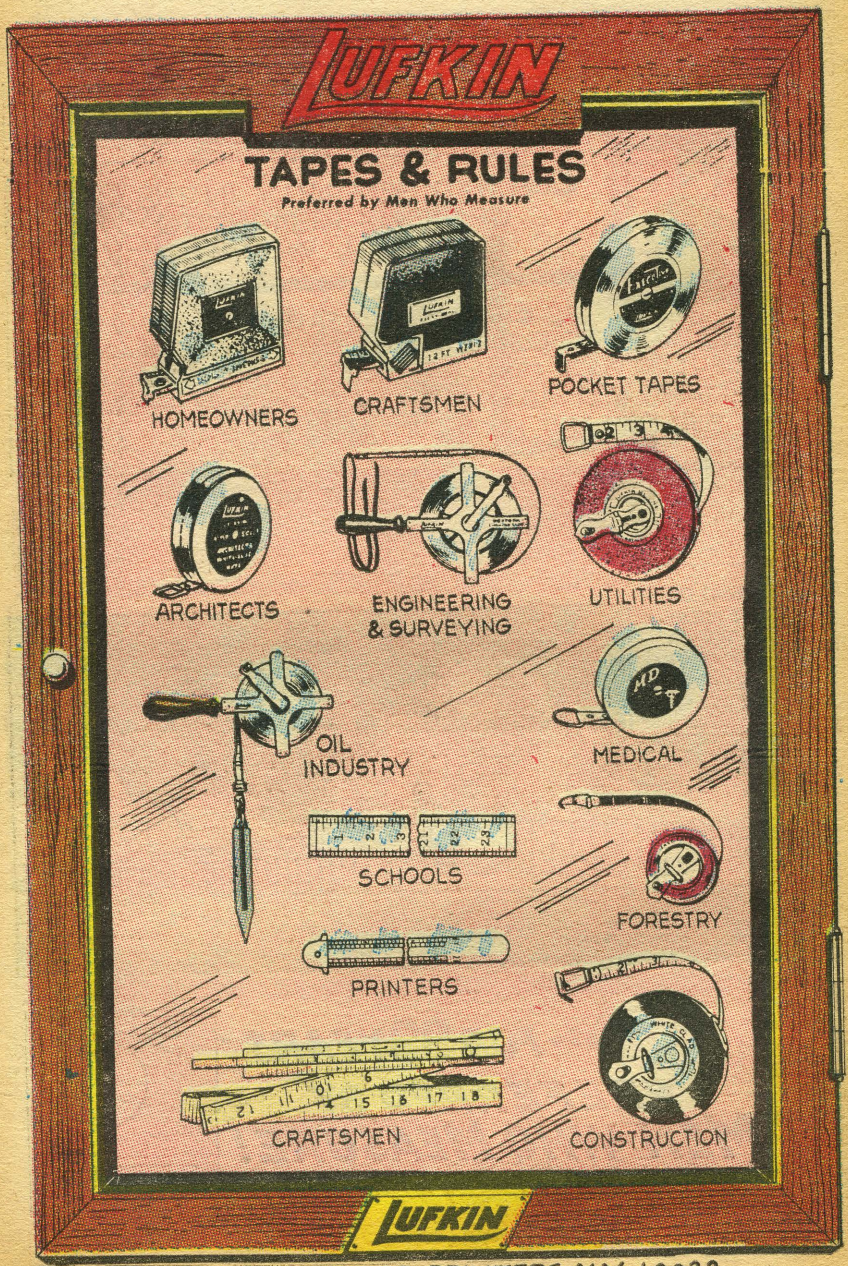
CREDITED GENERALLY IN THE FIELD OF MEASUREMENT TO LUFKIN, WE FIND---

CHROME CLAD SATIN FINISH ON STEEL TAPES, PROVIDING DURABLE AND EASY-TO-READ MARKINGS IN BRIGHT OR POOR LIGHT. INSTANTANEOUS READINGS ON STEEL TAPES. SELF-ADJUSTING HOOKS ON TAPE-RULES FOR EASY BUTT-END AND HOOK-OVER MEASUREMENTS.

OVER 600 DIFFERENT MEASURING TOOLS ARE PRODUCED IN THIS GREAT LUFKIN PLANT.



LUFKIN---FOR 99 YEARS PREFERRED BY MEN WHO MEASURE!



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